

THE INVENTION CLAIMED IS

1. An apparatus for dielectrophoretic concentration of particles under electrokinetic flow, comprising:

at least one microfluidic channel,

means for producing a DC voltage across ends of ^{each} said microfluidic channel

at least one pair of interdigitated electrodes located on a surface of ^{each} said microfluidic channel, and

means for producing an AC voltage across the interdigitated electrodes.

2. The apparatus of Claim 1, additionally including a plurality of pairs of interdigitated electrodes along a length of said microfluidic channel

3. In a microfluidic device using electrokinetic/electroosmotic flow to sweep particles down a microfluidic channel, improvement comprising:

interdigitated electrodes patterned on an inner surface of a microfluidic channel, and means for applying an AC voltage across the

5 interdigitated electrodes to set up a non-uniform electric field capable of trapping particles using a dielectrophoretic force as the particles are swept down the microfluidic channel electrokinetically.

4. The improvement of Claim 3, additionally including a plurality of spaced pairs of interdigitated electrode located along a length of said microfluidic channel.

5. The improvement of Claim 3, wherein said patterned interdigitated electrodes each comprising a first section with spaced second and third sections
10 extending transversely from said first section, said first section of each electrode being positioned substantially parallel, with a third section of one of the electrode

being located intermediate the spaced second and third sections of the other electrode.

6. A method for concentrating particles under electrokinetic flow, comprising:

forming at least one pair of interdigitated electrodes on a fluidic microchannel through which particles are swept electrokinetically, and

applying an AC voltage across the interdigitated electrodes to establish a non-uniform electric field capable of trapping particles using the dielectrophoretic force.

7. The method of Claim 6, additionally including applying a DC voltage across ends of the fluidic microchannel to initiate an electrokinetic/electroosmotic flow field.

8. The method of Claim 6, additionally including forming a plurality of space pairs of interdigitated electrodes along a length of the fluidic microchannel.

9. The method of Claim 8, additionally including controlling the voltage applied to each pair of interdigitated electrodes